

1 CLAIMS

2 I claim:

3
4 1. A document scanning apparatus comprising:

5 a base unit;

6 an optical scanning device located within the base unit;

7 a cover freely removable from the base unit; and

8 a document positioning device configured to move a document with respect to
9 the optical scanning device when the document is positioned between the base unit and
10 the cover.

11
12 2. The document scanning apparatus of claim 1, and wherein the document
13 positioning device comprises a cylindrical powered roller.

14
15 3. The document scanning apparatus of claim 1, and wherein the document
16 positioning device comprises a driven ball.

17
18 4. The document scanning apparatus of claim 3, and wherein the driven ball is
19 configured to be selectively driven in either a first direction or in a second direction which
20 is orthogonal to the first direction.

21
22 5. The document scanning apparatus of claim 1, and further comprising an
23 alignment device configured to maintain the cover in a relatively fixed spatial position
24 with respect to the base unit when the document positioning device is moving a
25 document.

26
27 6. The document scanning apparatus of claim 5, and wherein the alignment device
28 comprises a first magnet located in the cover, and a second magnet located in the base
29 unit, and wherein the magnets are in proximity to one another when the cover is aligned
30 over the base unit.

1 7. The document scanning apparatus of claim 5, and wherein the base unit is
2 defined by four corners and the cover is defined by four corresponding corners, and
3 further wherein the alignment device comprises magnets located adjacent each of the
4 four corners defining the base unit and the four corresponding corners defining the
5 cover.

6
7 8. The document scanning apparatus of claim 7, and wherein the document
8 positioning device comprises a first driven ball located adjacent a first one of the four
9 corners which define the base unit and a second driven ball located adjacent a second
10 one of the four corners which define the base unit.

11
12 9. The document scanning apparatus of claim 8, and further comprising a first idler
13 ball located adjacent a third one of the four corners which define the base unit and a
14 second idler ball located adjacent a fourth one of the four corners which define the base
15 unit.

16
17 10. The document scanning apparatus of claim 5, and wherein:
18 the document positioning device comprises a cylindrical powered roller positioned
19 within the base unit; and
20 the alignment device comprises an arcuate bearing surface defining a pocket in
21 the cover and configured to receive at least a portion of the powered roller therein when
22 the cover is aligned on the base unit.

23
24 11. The document scanning apparatus of claim 5, and wherein:
25 the document positioning device comprises a cylindrical powered roller; and
26 the alignment device comprises a plurality of parallel, spaced apart cylindrical
27 bearings configured to contact the powered roller when the cover is aligned on the base
28 unit.

29
30 12. The document scanning apparatus of claim 1, and further comprising a
31 rectangular platen defined by a first side and a second orthogonal side and supported in
32 the base unit, and wherein the alignment device comprises a first powered roller located
33 adjacent the first side of the platen and a second powered roller located adjacent to the
34 second side of the platen.

1 13. The document scanning apparatus of claim 12, and wherein the platen is further
2 defined by a third side opposite the first side, and a fourth side opposite the second side,
3 and wherein the alignment device further comprises a third powered roller located
4 adjacent the third side of the platen and a fourth powered roller located adjacent to the
5 fourth side of the platen.

6
7 14. The document scanning apparatus of claim 13, and wherein the powered rollers
8 are selectively retractable to move out of contact with a document placed over the
9 platen.

10
11 15. The document scanning apparatus of claim 1, and wherein the document
12 positioning device is located within the base unit.

13
14 16. A document scanning apparatus comprising:
15 an optical scanning device;
16 a document positioning device configured to position a document with respect to
17 the optical scanning device;
18 a processor; and
19 a document positioning program configured to be executed by the processor and
20 cause the processor to actuate the document positioning device.

21
22 17. The document scanning apparatus of claim 16, and further comprising a platen
23 over which a document can be positioned by the document positioning device, and
24 wherein the optical scanning device is located adjacent the platen.

25
26 18. The document scanning apparatus of claim 17, and wherein the platen is defined
27 by at least one edge, the apparatus further comprising a document edge detector
28 located proximate the at least one edge of the platen, and wherein:

29 the document edge detector is configured to transmit a signal to the processor in
30 response to detecting one of the presence or absence of an edge of a document
31 proximate the at least one edge of the platen; and

32 the document positioning program is further configured to cause the processor to
33 actuate the document positioning device when the document edge detector does not
34 detect the edge of a document.

19. The document scanning apparatus of claim 17, and wherein:
the optical scanning device is moveable with respect to the platen; and
the document positioning program is further configured to cause the processor to
move the optical scanning device past the platen after the processor has actuated the
document positioning device.

20. The document scanning apparatus of claim 17, and wherein:
the platen is defined by a length and a width;
a document defined by a document width greater than the platen width, and a
document length greater than the platen length, can be placed over the platen; and
the document positioning program is further configured to cause the processor to
actuate the document positioning device to move portions of the document which
exceed the platen width and the platen length over the platen.

21. The document scanning apparatus of claim 16, and wherein the document
positioning device is configured to selectively move the document in a first direction and
in a second direction orthogonal to the first direction.

22. A method of optically scanning an oversized document, comprising:
placing a first portion of the document over a platen so that a second portion of
the document is not placed over the platen;
optically scanning the first portion of the document by moving an optical scanning
device past the first portion of the document;
automatically moving the document in a first direction so that the second portion
of the document is placed over the platen; and
optically scanning the second portion of the document by moving the optical
scanning device past the second portion of the document.

23. The method of claim 22, and wherein, when the document is placed over the
platen a third portion of the document is not placed over the platen, the method further
comprising:
automatically moving the document in a second direction which is orthogonal to
the first direction so that the third portion of the document is placed over the platen; and
optically scanning the third portion of the document by moving the optical
scanning device past the third portion of the document.

1 24. The method of claim 22, and further wherein the scanning of the first and second
2 portions of the document generate respective first and second scanned image
3 segments, the method further comprising compiling the first and second scanned image
4 segments into a single scanned image.

5
6 25. The method of claim 22, and wherein the document is defined by a first edge
7 which is not placed over the platen when the first portion of the document is placed over
8 the platen, the method further comprising automatically and sequentially moving the
9 document a plurality of times in the first direction over the platen until the first edge of the
10 document is placed over the platen, and optically scanning the document each time the
11 document is sequentially moved over the platen in the first direction.

12
13 26. The method of claim 25, and wherein the document is defined by a second edge
14 which is not placed over the platen when the first portion of the document is placed over
15 the platen, the second edge being orthogonal to the first edge, the method further
16 comprising automatically and sequentially moving the document a plurality of times in a
17 second direction over the platen until the second edge of the document is placed over
18 the platen, and optically scanning the document each time the document is sequentially
19 moved over the platen in the second direction.

20
21 27. A document scanning apparatus comprising:
22 a base unit;
23 an optical scanning device located within the base unit;
24 a cover freely removable from the base unit; and
25 a plurality of driven balls in the base unit, the drive balls configured to contact a
26 document placed over the base unit and move the document with respect to the optical
27 scanning device when the cover is placed over the document.

28
29 28. The document scanning apparatus of claim 27, and further comprising an
30 alignment device configured to maintain the cover in a relatively fixed spatial position
31 with respect to the base unit when the document positioning device is moving a
32 document.

1 29. The document scanning apparatus of claim 28, and wherein:

2 the cover comprises a plurality of idler balls configured to mate to a
3 corresponding driven ball in the base unit; and

4 the alignment device comprises a first set of magnets located in the base unit,
5 and a corresponding second set of magnets in the cover.
6

7 30. The document scanning apparatus of claim 28, and wherein the cover includes a
8 plurality of cup-shaped arcuate surfaces, each such surface configured to receive a
9 corresponding one of the driven balls when the cover is placed over the base unit.
10

11 31. A document scanning apparatus comprising:

12 a base unit;

13 an optical scanning device located within the base unit;

14 a cover freely removable from the base unit;

15 a document positioning device configured to move a document with respect to
16 the optical scanning device when the document is positioned between the base unit and
17 the cover;

18 a processor; and

19 a plurality of document edge detecting sensors positioned within the base unit ,
20 each edge detecting sensor configured to transmit a signal to the processor in response
21 to detecting one of the presence or absence of an edge of a document placed over the
22 base unit.
23

24 32. The document scanning apparatus of claim 31, and further comprising a platen
25 defined by edges and supported by the base unit, and wherein the edge detecting
26 sensors are positioned proximate the edges of the platen.
27

28 33. The document scanning apparatus of claim 31, and wherein:

29 the document positioning device comprises an actuator;

30 the processor is configured to actuate the actuator in response to a signal
31 transmitted to the processor by a edge detecting sensor.
32
33

1 34. The document scanning apparatus of claim 33, and further comprising a
2 document positioning program configured to be executed by the processor and to
3 instruct the processor to selectively actuate the actuator.
4

5 35. A document scanning apparatus comprising:
6 a base unit;
7 an optical scanning device located within the base unit;
8 a cover freely removable from the base unit; and
9 a plurality of cylindrical powered rollers in the base unit, the powered rollers
10 configured to contact a document placed over the base unit and move the document
11 with respect to the optical scanning device when the cover is placed over the document.
12

13 36. The document scanning apparatus of claim 35, and further comprising a
14 rectangular platen defined by a first edge and a second orthogonal edge and supported
15 in the base unit, and wherein the plurality of powered rollers include a first powered roller
16 located adjacent the first edge of the platen and a second powered roller located
17 adjacent to the second edge of the platen.
18

19 37. The document scanning apparatus of claim 36, and wherein the platen is further
20 defined by a third edge opposite the first edge, and a fourth edge opposite the second
21 edge, and wherein the plurality of powered rollers include a third powered roller located
22 adjacent the third edge of the platen and a fourth powered roller located adjacent to the
23 fourth edge of the platen.
24

25 38. The document scanning apparatus of claim 37, and wherein the powered rollers
26 are configured to be selectively put into and taken out of contact with a document placed
27 over the base unit.
28

29 39. The document scanning apparatus of claim 35, and further comprising the an
30 alignment device configured to maintain the cover in a relatively fixed spatial position
31 with respect to the base unit when the document positioning device is moving a
32 document, the alignment device comprising an arcuate bearing surface defining a pocket
33 in the cover and configured to receive at least a portion of the powered roller therein
34 when the cover is aligned on the base unit.
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